

ABSTRACT

Water contained in cathode effluent from a cathode (1B) of the fuel cell power plant is condensed by a condenser (8) and recovered to a water tank (10). Water in the water tank (10) is supplied from a pump (17) to a humidifier (4) which humidifies hydrogen-rich gas supplied to an anode (1A) via a water passage (9B). When the power plant stops operating, a controller (30) first recovers water in the water passage (9B) to the water tank (10). Also, the freezing probability of the water passage (9B) is determined from the temperature detected by an outside air temperature sensor (31), and a wait time is set according to the freezing probability. By opening a drain valve (15) and draining residual water in the water passage (9B) after the wait time has elapsed, freezing of the water passage (9B) can be prevented with a minimum water drainage amount.

(19) World Intellectual Property Organization International Bureau



(43) International Publication Date
15 January 2004 (15.01.2004)

PCT

(10) International Publication Number
WO 2004/006369 A2

(51) International Patent Classification⁷: **H01M 8/00** [JP/JP]; 1-59-21, Higashiasahina, Kanazawa-ku, Yokohama-shi, Kanagawa 236-0033 (JP).

(21) International Application Number:

PCT/JP2003/007258

(74) Agent: **GOTO, Masaki**; Shoyu-Kaikan, 3-1, Kasumigaseki 3-chome, Chiyoda-ku, Tokyo 100-0013 (JP).

(22) International Filing Date: 9 June 2003 (09.06.2003)

(81) Designated States (*national*): CN, KR, US.

(25) Filing Language: English

(84) Designated States (*regional*): European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR).

(26) Publication Language: English

Published:
— without international search report and to be republished upon receipt of that report

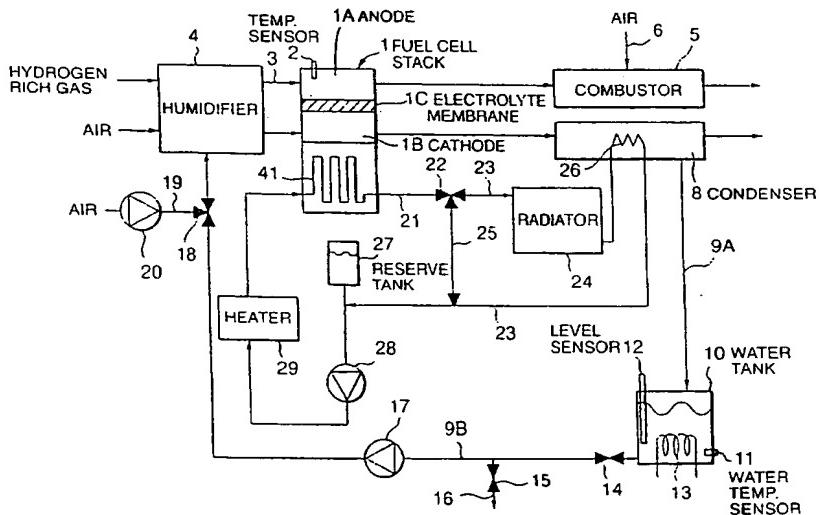
(30) Priority Data:
2002-197117 5 July 2002 (05.07.2002) JP

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(71) Applicant (for all designated States except US): **NISSAN MOTOR CO., LTD.** [JP/JP]; 2, Takara-cho, Kanagawa-ku, Yokohama-shi, Kanagawa 221-0023 (JP).

(72) Inventor; and
(75) Inventor/Applicant (for US only): **FUKUDA, Takashi**

(54) Title: FUEL CELL POWER PLANT



(57) Abstract: Water contained in cathode effluent from a cathode (1B) of the fuel cell power plant is condensed by a condenser (8) and recovered to a water tank (10). Water in the water tank (10) is supplied from a pump (17) to a humidifier (4) which humidifies hydrogen-rich gas supplied to an anode (1A) via a water passage (9B). When the power plant stops operating, a controller (30) first recovers water in the water passage (9B) to the water tank (10). Also, the freezing probability of the water passage (9B) is determined from the temperature detected by an outside air temperature sensor (31), and a wait time is set according to the freezing probability. By opening a drain valve (15) and draining residual water in the water passage (9B) after the wait time has elapsed, freezing of the water passage (9B) can be prevented with a minimum water drainage amount.

WO 2004/006369 A2